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ECHELLITE, A NEW MINERAL

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In some specimens of a basic intrusive shown me by Dr. M. Y. Williams, of the Geological Survey of Canada, small spheroidal masses of a radiating fibrous mineral were observed, having the appearance of a zeolite. The association is that to be expected of a zeolite, but optical examination brought out the fact that the properties of this mineral did not correspond with those listed for any of the minerals of that large group. In fact, no mineral with corresponding optical properties could be found, and accordingly as complete an examination as the material at hand permitted was undertaken.

The specimens were obtained at the Sextant Portage, Abitibi River, Northern Ontario, by W. R. Maher, Locating Engineer, T. & N. O. Ry. The mineral was apparently noted some years ago by O. E. Leroy, at least in thin sections, as he speaks of basic intrusives from this locality as containing a fibrous zeolite.¹

The rounded masses of the mineral are at times as much as 1 cm. in diameter, tho usually much smaller. It has a white color, porcelain-like where the fibers are very fine and more nearly glassy where the fibers are coarser and might better, perhaps, be termed needles. The hardness of the needles is about 5. The masses are sometimes embedded in patches of calcite, and sometimes in the basic rock itself. The crystallization is probably orthorhombic but the forms and angles are unknown.

The optical properties, measured in immersion liquids under the microscope, are:

$$\alpha = 1.530; \beta = 1.533; \gamma = 1.545; \pm 0.001; +; 2V = 50^\circ \pm 5^\circ$$

¹ Geol. Survey Can., *Summary Rep't.*, 1902-3, 237A.

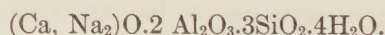
The elongation of the fibers is Y and there is perfect cleavage parallel to the plane YZ . In crushed material as used in immersion liquids most of the grains show, therefore, the indices β and γ and have negative elongation. Fairly frequently the flattened needles are turned sufficiently to show a somewhat oblique emergence of an optic axis. Only very rarely do they show positive elongation (β and α) in which case α can be determined, and an interference figure showing emergence of the acute bisectrix Z observed. It will be noted that the indices are somewhat higher than those of any of the other zeolites; and that the birefringence is rather strong.

A chemical analysis was made on carefully selected material. There was not a sufficient amount for duplicate analysis, but the mineral is decomposable directly by HCl and the constituents are few, the manipulations consequently simple, and I have confidence in the result:

TABLE 1
ANALYSIS OF ECHELLITE

		Mols.	Ratios
$H_2O \pm$	14.4	.800	4.15
SiO_2	34.5	.573	2.97
Al_2O_3	40.0	.391	2.02
CaO	7.2	.128	1.00
BaO	none	—	
Na_2O	4.1	.065	
K_2O	slight trace	—	
Sum	100.2		

The water determination, which gives a ratio 0.15 more than a whole number, includes both hygroscopic and combined water; and the excess no doubt represents the former. It may safely be stated, therefore, that the composition of the mineral is:



This result confirms the conclusion based on the optical properties, that the mineral is one not hitherto described and the name echellite is proposed for it from the French *échelle* = ladder, in allusion to the fact that the ratios come out stepped, as 1, 2, 3, 4.

It is noteworthy that the ratio $\text{CaO} : \text{Na}_2\text{O} = 2 : 1$, but whether this ratio is essential cannot be determined from a single example; and in writing the formula it has been assumed that it is variable, as is the case in most related minerals. For the ratio $\text{Al}_2\text{O}_3 : (\text{Ca}, \text{Na}_2)\text{O} = 2 : 1$, found in this mineral, there is no parallel among the zeolites, where this ratio is practically always $1 : 1$. The formula can be written in a manner suggesting a hydrated zoisite, tho not corresponding entirely. There is no particular reason for so writing it, except that a compound suggesting a hydrated zoisite is a not unlikely alteration product of a basic igneous rock. The correspondence is mentioned for what it may be worth and is shown in the following:

Echellite . . $(\text{Ca}, \text{Na}_2) (\text{Al OH})_2 \text{Al}_2 (\text{SiO}_4)_3 \cdot 3\text{H}_2\text{O}$

Zoisite . . . $\text{Ca}_2 (\text{Al OH}) \text{Al}_2 (\text{SiO}_4)_3$

THE CALCITE CAVE IN THE NEW YORK STATE MUSEUM

H. F. GARDNER

New York State Museum

A reproduction of the famous Sterlingbush cavern has recently been completed in the New York State Museum at Albany. The size of the crystals, their unusual color and the ingenious method of construction of the exhibit make a short description of it worth while.

The Sterlingbush calcite crystals are well known to mineralogists. The cave from which they came was discovered during the process of quarry operations, after a blast had exposed a small opening 6 meters above the floor in the open face of a limestone quarry at Sterlingbush, Lewis County, northern New York, in 1906; it was first brought to the attention of scientists by Dr. D. H. Newland. The entrance consisted of a horizontal fissure that gradually widened to about one meter and extended a distance of 15 meters, leading into a chamber about 4 meters wide and $2\frac{1}{2}$ meters high. Beyond this room the cave contracted, took a downward course, and came gradually to an end, as developed from further quarry work. The floor and lower sides of this chamber were covered with large calcite crys-

tals, violet to lavender in color and partially covered with a thin secondary coating of aragonite. The crystals, as described in detail by Mr. H. P. Whitlock¹ are fairly simple, rhombohedron and base predominating, modified by smaller scalenohedral faces. Frequent penetration twins occur, especially in the larger crystals.

The upper sides and top of the cave were covered with much smaller, nearly colorless crystals, mostly rhombohedral in habit but partly scalenohedral. Members of the State Museum staff visited this locality and in a period of six weeks collected about 14 tons of crystals which were packed in 80 barrels, 14 kegs and 22 boxes. One specimen now exhibited in a special case in the museum consists of four large individuals twinned together, the combined weight being about 500 kilograms.

The reproduction of this cave, now on exhibition, has been made by Noah T. Clarke, museum technician, assisted by Charles P. Heidenrich. The door and brick work were torn away from the side of a small room that opened into the museum. In this room was constructed a strong steel framework about the same shape, and one half the size, of the original cavern. The top of this steel cage was securely fastened to an iron girder by a truss rod and turnbuckle in order to lessen the strain on the floor. Ten decimeters up from the bottom of the framework a solid flooring was laid, and upon this the larger crystals were set, in a mixture of plaster of Paris and excelsior, space being provided behind each large crystal for an electric light. Much careful work was done in removing the secondary aragonite by means of dilute acid and scrubbing brushes. Smaller crystals were then attached to the sides and top as follows: A hole bored in the crystal was filled with melted sulfur, a strong iron eyebolt was then inserted, and the whole allowed to cool. This method is sometimes used by quarrymen in picking up large blocks of stone with a derrick, and it is nearly impossible to remove the bolt by a steady pull. These crystals were then attached to the framework by means of the bolt and mortar made of plaster of Paris. Great care was necessary in fitting the various crystals together and it was three months before this part of the work was completed. Two mirrors, cleverly concealed in opposite corners, give the effect of the smaller, more contracted portion of the cavern.

¹ *N. Y. State Mus. Mem.*, 13, 78-81, 1910.

Provision was made for placing about thirty electric bulbs of from 20 to 60 watt sizes, behind the more prominent crystals. The crystals in daylight are a dull lavender or violet color, but by shutting off as much daylight and reflected light as possible, and using only transmitted light, a beautiful deep rose red to light pink color was obtained, depending on the thickness of the crystal and the intensity of the transmitted light. The side of the room was then walled in, leaving an opening 6 decimeters square thru which to view the interior. The wonderful beauty of the softly glowing, rose red crystals, which might be likened to an array of huge precious stones, more than compensates for the inaccuracy of this lighting arrangement, from the strictly scientific view point. Directly opposite the opening is a large deep rose red crystal, consisting of simple rhombohedron and basal pinacoid modified by small scalenohedral faces. This crystal weighs about 180 kilograms, shows no evidence of twin structure and is without doubt one of the largest, if not the largest, crystal of its kind ever exhibited.

A chemical analysis of these crystals gives the following impurities: Fe 0.08, Mn 0.12, and Mg 0.09 per cent.

The relatively high percentages of iron and manganese are rather unusual for calcite. As these two elements are no doubt present as carbonates, the complete analysis would be as follows:

FeCO ₃	0.17
MnCO ₃	0.25
MgCO ₃	0.32
CaCO ₃ [by difference].....	99.26
Sum.....	100.00

The neodymium, which, as shown by Dr. Edgar T. Wherry,¹ is the cause of the color, is present in amounts too small for analytical recognition.

In boring the crystals it was found that some resisted the action of a bit much more than others. A careful chemical investigation failed to show any reason for this phenomenon; but no other impurities than those mentioned above being discovered, it must have been due to physical rather than chemical causes.

¹ Neodymium as the cause of the red-violet color of certain minerals. *J. Wash. Acad. Sci.*, 7, 143, 1917.

NOTE ON THE COMPOSITION OF ALLANITE

THOMAS L. WATSON

University of Virginia

The purpose of the present note is to direct attention to two publications, recently issued, on different features of allanite—one on refractive indices,¹ the other on weathering²—which have an important bearing on the composition of this mineral.

That a lack of constant chemical composition is exhibited by allanites, even when unaltered, is well known from the numerous recorded analyses of specimens of the mineral from the principal localities in this country and abroad. The recent work carried out independently by Zenzén and Watson on allanites fully accounts for their variable composition. In each case the data obtained by microscopic study show that ordinary black vitreous allanite is not homogeneous, but is composed of a mixture of at least two types of material, the proportions of which vary widely in the allanites studied. The more important facts which bear on the composition of allanites as developed in the two studies are summarized below.

Imperfect knowledge of the "refractive power" of allanite led Zenzén to investigate this property of the mineral, employing the immersion method. Forty specimens, representing "comparatively large fragments or individuals," were selected, 35 of which were from localities in Norway and Sweden. No American localities were represented. Both fresh and altered allanites were studied, the former being of the black variety. Many of the observations were made on specimens previously analyzed, which gives added value to the results.

Specific gravity determinations were made in order to study the relation between this property and refractive index. The results obtained show that the medium refractive index of allanite decreases fairly regularly with decreasing specific gravity. This would be expected, since it is well known that allanites with low specific gravity (about 3.1 and less, according to Zenzén) are strongly altered, a condition which is usually clearly indicated under the microscope.

¹ Zenzén, N., Determinations of the power of refraction of a number of allanites, *Bull. Geol. Inst. Univ. Upsala*, **15**, 61-76, 1916.

² Watson, Thomas L., Weathering of allanite. *Bull. Geol. Soc. Am.*, **28**, 463-500, 1917.

Zenzén found that unaltered or but slightly altered allanites were birefracting and pleochroic, and had a high specific gravity and a correspondingly high medium refractive index. He found on the other hand, that allanites, originally birefracting and presumably pleochroic, with specific gravity less than 3.50 and refractive index less than 1.70, were, in most cases, isotropic. No isotropic allanites were observed to have a specific gravity above 3.50 or refractive index above 1.70.

The conclusion to be drawn from these data is that isotropic allanite represents the altered form of the mineral and is derived from crystalline allanite, the original fresh mineral. This is not in accord, however, with recent results obtained by E. S. Larsen¹ on some American allanites, which appeared to indicate that the birefracting (crystalline) allanite substance, at least in the specimens studied, was secondary and was derived from the isotropic form.

The investigation by Watson was primarily concerned with the advanced stage of weathering of allanites, in which the fresh mineral substance and its weathered product were both physically and chemically unlike. However, in the early part of the study, attention was paid to the composition of the supposedly fresh mineral, and the results obtained led to the conclusion that the black vitreous allanites investigated were not homogeneous. They proved to be composed of a mixture of at least two types of material, the proportions of which varied widely in the specimens studied. One was isotropic; the other was birefracting and apparently derived from the first either by alteration or inversion, probably the former.

The two investigations establish microscopically, then, the lack of homogeneous character of black allanites, a conclusion which is in agreement with their variable chemical composition. Whether the isotropic and crystalline forms are chemically similar or dissimilar remains to be established by further investigation. It is generally assumed, chiefly on the basis of water content, that the change of one into the other is an alteration and not an inversion; but additional study is needed to definitely prove which of these processes is responsible.

¹ Quoted by Watson, Thomas L., *work cited*, pages 481-482.

PROCEEDINGS OF SOCIETIES

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, November 13, 1919

A stated meeting of The Philadelphia Mineralogical Society was held on the above date with the president, Dr. Burgin, in the chair. Twenty-four members and visitors were present.

Mr. Frank J. Keeley addressed the society on "Gem-stones." The various characters of gem-stones: specific gravity, index of refraction, double refraction, dichroism, hardness, inclusions, and absorption spectra, were briefly described. The absorption spectra of certain gems—zircon, garnet, ruby, spinel, and peridot, were shown to be characteristic, and sufficient to identify them. Hardness should never be used to test gems excepting in stones suspected of being glass, in which case it is preferable to make a test of the conductivity of heat of the stone. The iridescence in opal, labradorite, and pearls is shown by the spectroscope and polarizing microscope to be due to the interference of light caused by the succession of thin laminas. In conclusion, the speaker described imitations and synthetic stones. Forty-one watch-cases of cut stones were exhibited, and the absorption spectrum of zircon was shown with a microspectroscope.

Mr. Gordon reported a trip to a cave at Redington, on the Lehigh River, exhibiting specimens of stalactites. He reported that the lansfordite crystal-stalactites in the Academy collections were practically destroyed.

SAMUEL G. GORDON, *Secretary*

NEW YORK MINERALOGICAL CLUB

November 19, 1919

The regular monthly meeting of the New York Mineralogical Club was held in the American Museum of Natural History on November 19th, with the Vice-President, Mr. George E. Ashby, presiding and an attendance of 17 members and 3 guests.

The minutes of the last meeting were read and approved. The following names were submitted to the Nominating Committee for election to membership: Mr. J. B. Erickson, of 359 Mosholu Parkway, proposed by Mr. Winttingham and seconded by Mr. Whitman; Dr. John B. Ferguson, of the research laboratory, Western Electric Co., proposed by Mr. Whitlock and seconded by Mr. Ashby.

The Recording Secretary read a letter from a photographer, offering to make a group picture of the officers and members of the Club. It was moved by Mr. Stanton, seconded by Mr. Lee, that this offer be declined with thanks; and the motion was unanimously carried.

The Recording Secretary then read a letter from Mr. Mott describing his experiences on the Columbus Day field excursion to Franklin Furnace. Mr. Broadwell and Mr. Allen related the results of their participation in the excursion. Discussion brought out the fact that 12 members of the Club

had made the Franklin trip. The Recording Secretary suggested the desirability of opening some discussion relative to available objectives for future excursions. Mr. Allen, on behalf of the Excursion Committee, pointed out that the members of that Committee had found that neighboring localities are, in general, not now available for collecting. Mr. Ashby mentioned the dumps at Tilly Foster as well worth visiting. Mr. Hoadley called attention to the localities at Chimney Rock, Bound Brook and Somerville, N. J.

The Chair then introduced the discussion of the evening, on notable specimens brought to the meeting by members of the Club. In the course of this discussion Mr. Wintringham exhibited a miscellaneous series of minerals, all of them presenting features of interest which he pointed out. Mr. Whitlock exhibited three recently acquired specimens from the Tilly Foster mine, and a large quartz crystal from a new locality in the Borough of Bronx. Mr. Hoadley showed a large suite of specimens from a number of localities in Connecticut, New Jersey, New York and New Hampshire, the results of his collecting trips, many of which were of marked interest.

Mr. Radu showed a series of lithia minerals from Maine localities of Mt. Mica and Mt. Apatite and explained their genetic relations. Mr. Lee exhibited several minerals from Franklin Furnace, including a small vial of minute crystals which he submitted to the members for determinative comments. Mr. Ashby showed a fine series representing the Tilly Foster serpentine pseudomorphs which he had collected from the dumps several years ago, drawing the attention of the Club to the possibilities of this locality as a profitable collecting field. Mr. Stanton read a letter from Dr. Hawkins relating to the staurolite from Patrick Co., Va., a subject which had been discussed at the Club meeting of October, 1918. The Recording Secretary distributed copies of a list of the minerals occurring at Franklin Furnace, prepared by Mr. Hoadley.

HERBERT P. WHITLOCK, *Recording Secretary*

NEWARK MINERALOGICAL SOCIETY

The December meeting of the Newark, N. J., Mineralogical Society was held at the Newark Technical School, Sunday, Dec. 7, at 3 P.M., and attended by twelve members and one visitor.

The subject for study was Hematite. A splendid exhibit of about one hundred specimens of the specular, kidney and needle varieties was made. Mr. C. W. Hoadley, of Englewood, N. J., called the attention of the Society to a specimen of quartz sandstone from Gambelli's Quarry, near Alpine, N. J., in which a "vug" held minute crystals of specular iron very neatly arranged.

The topic assigned for the January meeting was: The minerals of the Tilly Foster Mine at Brewster Station, N. Y., accompanied by an exhibit of specimens.

CHARLES A. COLTON, *President*

ORGANIZATION MEETING OF THE MINERALOGICAL SOCIETY OF AMERICA

In connection with the thirty-second annual meeting of the Geological Society of America, a group of 28 mineralogists met at the Geological Museum of Harvard University on December 30, 1919. There were present:

E. Q. Adams	G. F. Kunz	E. Thomson
F. D. Adams	G. P. Merrill	F. R. Van Horn
A. W. Doubleday	C. Palache	A. J. Walcott
A. S. Eakle	A. B. Peck	T. L. Walker
W. E. Ford	A. H. Phillips	H. S. Washington
E. F. Holden	L. S. Ramsdell	E. T. Wherry
W. F. Hunt	C. H. Richardson	H. P. Whitlock
J. P. Iddings	A. F. Rogers	J. E. Wolf
A. A. Klein	C. B. Slawson	F. E. Wright
E. H. Kraus		

A number of mineralogists and geologists were prevented from attending by reason of taking part in the sessions of the Geological Society of America, but had expressed their interest in the purposes of the gathering; many commendatory letters had also been received from those unable to get to Boston.

A. H. Phillips (Princeton) was elected chairman, and A. F. Rogers (Stanford), secretary. E. H. Kraus (Michigan) outlined the need of a mineralogical society in the United States and Canada and told of the various steps that had led up to the organization of the society.

It was thereupon moved and carried that a Mineralogical Society of America be formed. A provisional draft of a Constitution and By-Laws, prepared by several of those interested, was laid before the meeting.

By general consent certain articles of the preliminary constitution and by-laws submitted by this voluntary committee were accepted. Corrections were made in various sections, as follows:

CONSTITUTION

Art. IV, Sect. 2, instead of "results of mineralogical or crystallographical research" should read "results of research in mineralogy, crystallography, or allied sciences."

Art. IV, Sect. 3, instead of "in mineralogical or crystallographical work" should read "in mineralogy, crystallography, or allied sciences."

Art. IV, Sect. 6, instead of "in mineralogy or crystallography" should read "in mineralogy, crystallography, or allied sciences."

BY-LAWS

No. I., Sect. 1, instead of "of mineralogy or crystallography" should read "of mineralogy, crystallography, or allied sciences."

Also in the second sentence instead of "in mineralogy or crystallography" should read "in mineralogy, crystallography, or allied sciences."

No. I., Sect. 2, instead of "to the elect" should read "to the elected."

No. I, Sect. 3, instead of "upon the non-resident list" should read "upon the inactive list."

No. IV, after the first sentence, the following should be inserted:

"The list shall be mailed to the Fellows for their information at least three months before the Annual Meeting. Any five Fellows may forward to the Secretary other nominations for any or all offices. All such nominations reaching the Secretary at least 40 days before the Annual Meeting shall be printed, together with the names of the nominators, as special tickets. The regular and special tickets shall then be mailed to the Fellows at least 25 days before the Annual Meeting."

It was moved, seconded, and carried that the Constitution and By-Laws thus revised be adopted. It was also voted that Section 2 of By-Law No. I and By-Laws No. IV and VIII be suspended until the next regular meeting to allow the lists of charter fellows and members to remain open for a year; and to permit officers to be elected by those present. The Constitution and By-Laws are printed in full below.

A motion that a nominating committee of three be appointed by the chair was then seconded and carried. Edgar T. Wherry, William E. Ford, and A. Albert Klein were appointed. This nominating committee, after deliberation, presented the following ticket for the consideration of the society:

<i>President:</i>	Edward H. Kraus (Michigan)
<i>Vice-President:</i>	Thomas L. Walker (Toronto)
<i>Secretary:</i>	Herbert P. Whitlock (Am. Mus., New York)
<i>Treasurer:</i>	Albert B. Peck (Bur. Stand., Washington)
<i>Editor:</i>	Edgar T. Wherry (Bur. Chem., Washington)
<i>Councilors:</i>	Arthur S. Eakle (California) (1 year)
	Frank R. Van Horn (Case) (2 years)
	Fred E. Wright (Geophys. Lab., Washington) (3 years)
	Alexander H. Phillips (Princeton) (4 years)

A motion that the Secretary be instructed to cast a ballot for these nominees was carried. Length of service of the councilors as given above was determined by lot.

It was moved and carried that the Council be instructed to investigate the question of affiliation with the Geological Society of America, and to report at the next meeting.

It was moved and carried that a vote of thanks be extended to the department of mineralogy of Harvard University for permission to inspect their mineralogical collections, and to hold the initial meeting of the Society in their quarters.

The meeting then adjourned.

AUSTIN F. ROGERS, *Secretary pro tem.*

The Council of the Mineralogical Society of America met on Wednesday morning, December 31. The question of affiliation with the Geological Society of America was discussed, but action was withheld until information as to the desires of the Council of the latter Society could be obtained. At the suggestion of Dr. Kunz, the metric system was endorsed.

It was decided to take over the *American Mineralogist* as the official Journal of the Mineralogical Society of America; and a board of editors was appointed;

as given on the cover of the present number. Subscription rates as also there indicated were adopted. The number of text-pages was authorized to be between 14 and 22, for the present.

A. B. PECK, *Secretary pro tem.*

PROVISIONAL CONSTITUTION AND BY-LAWS OF THE MINERALOGICAL SOCIETY OF AMERICA

CONSTITUTION

Article I.—Name

This Society shall be known as the Mineralogical Society of America.

Article II.—Object

The object of this Society shall be the advancement of mineralogy, crystallography, and allied sciences.

Article III.—Officers

The officers of the Society shall be a president, a vice-president, a treasurer, a secretary, and an editor, who shall be elected annually. There shall be an executive council consisting of the above officers, the retiring president, and four fellows at large, to be elected for terms of four years each.

Article IV.—Membership

Section 1. The general membership of the Society shall be composed of Fellows, Members, and Patrons. There may also be Correspondents.

Section 2. Fellows shall be persons who have published results of research in mineralogy, crystallography, or allied sciences, and who upon nomination by the council shall have been duly elected to fellowship in the Society.

Section 3. Members shall be persons not Fellows who are engaged or interested in mineralogy, crystallography, or allied sciences.

Section 4. Patrons shall be persons who have bestowed important favors upon the Society. Election to patronship carries with it the rights and privileges of Members.

Section 5. Fellows, Members, and Patrons shall be entitled to vote in the transaction of the regular business of the Society. Only Fellows are eligible to office in the Society.

Section 6. Correspondents shall be persons distinguished for their attainments in mineralogy, crystallography, or allied sciences and not resident in North America.

Article V.—Amendments

This constitution shall be amended when the proposed amendment is favored by four-fifths of all the Fellows voting upon it. A copy of the proposed amendment shall be mailed to the general membership of the Society at least thirty days before a vote is taken. Voting shall be by mail ballot.

BY-LAWS

I. *Membership*

Section 1. Eligibility. Any person who has, in the opinion of the Council, contributed materially to the advancement of mineralogy, crystallography, or allied sciences, shall be eligible to fellowship in the Society. Any person or corporation interested in mineralogy, crystallography, or allied sciences, shall be eligible to membership.

Section 2. Election. Nominations for all classes of membership must be made by two Fellows according to a form to be provided by the Council. One of these Fellows must be personally acquainted with the nominee and his qualifications for membership. The Council will submit the nominations received by them, if approved, to a vote of the Fellows in the manner provided in the By-Laws. The result may be announced at any stated meeting, after which notice shall be sent to the elected.

Section 3. Termination. Membership in the Society may be terminated or the names of the members may be placed upon the inactive list by vote of the Council.

II. *Dues*

Section 1. No person shall be accepted as a Fellow of the Mineralogical Society of America unless he pay the dues for the year within three months after notification of his election. The annual dues for Fellows shall be five dollars (\$5), payable at or before the annual meeting in advance.

Section 2. The annual dues for Members shall be three dollars (\$3). No person shall be accepted as a Member unless he pay the dues for the year within three months after notification of his election. The annual dues shall be payable at or before the annual meeting in advance.

Section 3. An arrearage in payment of annual dues shall deprive a Fellow or Member of the privilege of taking part in the management of the Society and of receiving the publications of the Society. An arrearage continuing over two (2) years shall be construed as notification of withdrawal.

Section 4. A single prepayment of one hundred dollars (\$100) shall be accepted as commutation for life for either Fellows or Members.

Section 5. Any person eligible under Article IV of the Constitution may be elected Patron upon the payment of one thousand dollars (\$1000) to the Society.

III. *Duties of Officers*

Section 1. Officers. The duties of the president, vice-president, treasurer, secretary, and editor of the Society shall be the usual ones performed by such officers.

Section 2. Executive Council. The Executive Council shall direct all affairs and activities of the Society not otherwise provided for by the Constitution, as well as perform those duties specifically assigned to it.

Section 3. Committees. The president shall appoint, with the approval of the Council, such committees as may further the objects of the Society, including a Board of Associate Editors. The treasurer, the secretary, the editor, and the chairmen of the various committees shall make formal reports to the Society at least once each year.

IV. *Election of Officers*

Nominations for office shall be made by the Council. The list shall be mailed to the Fellows for their information at least three months before the annual meeting. Any five Fellows may forward to the Secretary other nominations for any or all offices. All such nominations reaching the Secretary at least 40 days before the annual meeting shall be printed, together with the names of the nominators, as special tickets. The regular and special tickets shall then be mailed to the Fellows at least 25 days before the annual meeting. The nominations shall be submitted to a vote of the Fellows in the same manner as nominations for membership. The results shall be announced at the annual meeting, and the officers thus elected shall enter upon duty at the adjournment of the meeting.

V. *Publications*

The Society shall publish a Journal devoted to the advancement of mineralogy, crystallography, and allied sciences. The general membership of the Society shall be entitled to receive the Journal.

VI. *Local Sections*

Local sections of the Society may be formed in any locality, with the advice and consent of the Council, for the purpose of holding meetings and promoting coöperation. The affairs of such local sections shall be entirely in their own hands.

VII. *Meetings*

There shall be an annual meeting of the Society and such other meetings as may be called by the Council. The annual meeting shall be held, whenever practicable, at the same time and place as that of the Geological Society of America.

VIII. *Revision of the By-Laws*

After recommendation by the Council, By-Laws may be enacted, amended, or suspended by a two-thirds vote, by ballot, of the general membership of the Society.

INSPECTION OF THE BURRAGE COLLECTION

Having noticed in the November number of the *American Mineralogist* the proposed organization of a new mineralogical Society in Boston on December 30, 1919, Mr. Albert C. Burrage of that city, thru Professor A. C. Lane, invited the mineralogists in attendance to visit his residence and view his mineral collection. This kind invitation was accepted for December 29th, and a party of about 25 spent a pleasant hour there. The collection includes a magnificent series of native golds, many well crystallized; some wonderful crystallized proustites; and hundreds of showy specimens of other minerals and of precious stones. We hope some day to publish a detailed account of this splendid collection.

E. T. W.

EDITORIAL NOTE

Upon the taking over of this magazine by the Mineralogical Society of America, Mr. Harry W. Trudell has asked to be relieved of the duties of business manager. Mr. Trudell has held this position for three years, and it has been largely due to his self-sacrificing efforts in its behalf that the magazine has been able to survive during these trying times. Altho the necessary correspondence took practically all of his spare time, he handled it promptly, efficiently, and cheerfully. The editor is sure that all readers of the magazine will join him in extending herewith the heartiest thanks to Mr. Trudell.

NEW MINERALS

Under this heading we have endeavored to record all minerals described as new since the beginning of 1916. It is probable that a few have been missed, because of publication in out-of-the-way places, or in foreign journals the receipt of which has been delayed or prevented by the world war. Every effort will be made to bring the list up to date as soon as possible.

In a recent publication, "Eighth list of new mineral names" (*Mineralog. Mag.*, 18 (87), 373-390, 1919) Mr. L. J. Spencer has assembled a large number of names proposed during the past few years (together with some prior to 1916, which are not further noted here) some of which have not been definitely included heretofore in this department. An alphabetical list of these is given here, with a brief statement of synonymy, etc., names we prefer following the = sign. Such as represent rocks, coals, obvious mixtures of minerals, hypothetical isomorphous molecules, artificial products, variant spellings or unnecessary synonyms of accepted names, etc., will receive no further attention. Following the list, however, details are given for all important species or varieties included.

LIST OF NEW NAMES

Ambatoarinite (dated 1915, tho perhaps not published until 1916).

Amosite—see description below.

Auxite = lucianite, which see.

Arsenobismite—abstracted in *Am. Min.*, 1, 13, 1916.

Bariohitchcockite—chemical name for gorceixite—abstracted in *Am. Min.*, 2, 120, 1917.

Basobismutite—see note below.

Belgite = willemite.

Caldasite—an ore or rock.

Carbonate-apatite = carbapatite = dahllite = podolite.

Carbonate-sodalite—a hypothetical isomorph.

Clarain—a coal.

Cochranite—an artificial furnace product.

Cornetite—see description below.

Cornuite, the amorphous equivalent of chrysocolla—abstracted in *Am. Min.*, 3, 158, 1918.

Durain—a coal.

Ektropite = ectropite (Greek κ = English c).

- Ferroludwigite—chemical name for ludwigite—abstracted in *Am. Min.*, 2, 69, 1917.
- Fornacite, correct spelling of furnacite.
- Framesite—a variety of bort; seems hardly deserving of a special name.
- Fusain—a coal.
- Hematogelite, a simplified spelling of haematogelite.
- Högbomite = hoegbomite (Swedish ö = English oe).
- Hydrowollastonite = crestmoreite + riversideite.
- Iron-sarcolite—a hypothetical isomorph.
- Kalioalunite—chemical name for alunite—abstracted in *Am. Min.*, 2, 120, 1917.
- Kaliohitchcockite—a hypothetical isomorph—abstracted in *Am. Min.*, 2, 120, 1917.
- Katoptrite = catoptrite (Greek κ = English *c*).
- Lithargite, the correct form of the chemical name litharge when applied to a mineral. *Am. Min.*, 2, 19, 1917.
- Lucianite—see description below.
- Lusitanite = spencerite.
- Manganalmandine = manganiferous almandite.
- Natrohitchcockite—a hypothetical isomorph—abstracted in *Am. Min.*, 2, 120, 1917.
- Paredrite = impure rutile—abstracted in *Am. Min.*, 1, 53, 1916.
- Soda-sarcolite—a hypothetical isomorph.
- Strontiohitchcockite—chemical name for hamlinite or goyazite—abstracted in *Am. Min.*, 2, 120, 1917.
- Sulphate-apatite = sulfate-apatite—a hypothetical isomorph—abstracted in *Am. Min.*, 3, 178, 1918.
- Sulphatic cancrinite = sulfatic cancrinite—a member of an isomorphous series—abstracted in *Am. Min.*, 2, 13, 1917.
- Sulphurite = sulfurite (Latin *f* is not English *ph*).
- Trainite—a mixture of vashegyite and colloidal laubanite—abstracted in *Am. Min.*, 1, 15, 1916.
- Turite = turyite—see note below.
- Vitrain—a coal.
- Xanthochroite—the amorphous equivalent of greenockite—abstracted in *Am. Min.*, 3, 158, 1918.
- Zirkite—trade name for an ore or rock.

Amosite

A. L. Hall: The mode of occurrence of asbestos in the Transvaal. *Trans. Geol. Soc. S. Africa*, 21, 1-36, 1918.

NAME: After the initial letters of the company, "Asbestos Mines of South Africa."

PHYSICAL PROPERTIES: Color gray to white; structure fibrous; system monoclinic.

CHEMICAL PROPERTIES: An iron amphibole; represents either crocidolite lacking the usual blue color, or cummingtonite—gruenerite.

OCCURRENCE: Mined for asbestos in the Lydenburg and Pietersburg districts.
S. G. G.

Basobismutite

K. A. Nenadkevich: The bismuth minerals of the Transbaikalia. *Bull. acad. sci. Petrograd*, 7, 447-454, 1917. [Original not seen.] Abstracted, from *Chem. Abstr.*, in *Am. Min.*, 4 (3), 29, 1919; this mineral was mentioned without name in the abstract, but Mr. Spencer (paper above cited) notes that the above name was applied to it.

NAME: From the composition, basic bismuth carbonate.

PHYSICAL PROPERTIES: Apparently not specially described.

CHEMICAL PROPERTIES: Analysis shows the formula to be $2\text{Bi}_2\text{O}_3 \cdot \text{CO}_2 \cdot \text{H}_2\text{O}$.

OCCURRENCE: As a cement between beryl crystals from the Sherlov Mountains. E. T. W.

Cornetite

G. Césaro: (Preliminary announcement, without name) A new mineral from Katanga. *Ann. Soc. Geol. Belg.*, 39, B 241, 1912. (Description, also without name.) *Ann. Soc. Geol. Belg.*, 39, *Annexe rel. Congo Belge*, 41-48, 1912. H. Buttgenbach: In "Les Minéraux et les Roches" (Liege, 1916), p. 452; cited by Spencer, *Min. Mag.*, 18 (87), 376, 1919. [Original not seen.]

NAME: After Jules Cornet, who presumably first collected the mineral.

CRYSTALLOGRAPHIC PROPERTIES

System: Rhombic; $a : b : c = 0.9844 : 1 : 0.7679$; or $0.9771 : 1 : 0.7872$ in another orientation, to bring out relationships with certain other minerals.

Forms: first orientation, (110), (102), (111), (221).

PHYSICAL AND OPTICAL PROPERTIES

Color: blue, somewhat greenish; hardness = 5.5; mean refractive index around 1.7; double refraction very strong, around 0.120; extinction straight; $2E = 55^\circ$; sign—; optic axial plane (001), with $Bx_a \perp (100)$.

CHEMICAL PROPERTIES

Amount of material available too small for quantitative analysis, but qualitative tests show it to be essentially a phosphate of copper and cobalt, with a little arsenic but no vanadium. From the similarity of the crystallization and optical properties to those of libethenite, olivenite, herderite, etc., its formula is probably: $(\text{Cu}, \text{Co}) (\text{OH})\text{PO}_4$.

OCCURRENCE

On limestone, etc., from Katanga, Belgian Congo.

E. T. W.

Echellite

See *American Mineralogist*, 5, 1-3, 1920.

Lambertite

S. C. Lind and C. W. Davis: A new deposit of uranium ore. *Science*, 49, 441-443, May 9, 1919.

NAME: After the discoverer of the deposit, Mr. Ross Lambert.

PHYSICAL PROPERTIES: Not specially described.

CHEMICAL PROPERTIES: Composition stated to be UO_2 .

OCCURRENCE: Admixed with uraninite and uranophane in a quartzite lying between mica schist and granite at Silver Cliff Hill, 1.5 km. north of Lusk, Wyoming. S. G. G.

Lucianite

E. W. Hilgard: A peculiar clay from near the city of Mexico. *Proc. Nat. Acad. Sci.*, 2, 8-12, 1916.

NAME: After the locality, Hacienda Santa Lucia.

PHYSICAL PROPERTIES: A clay; swells up enormously when wet.

CHEMICAL PROPERTIES: Shown by analysis to have the composition of a hydrated talc. [Probably a form of stevensite, A. F. Rogers. See *Am. Min.*, 3, 158, 1918.]

OCCURRENCE: A weathering product of magnesian igneous rocks.

S. G. G.

Turyite

This mineral name has been usually spelled *turgite*, in accordance with the rule of priority. The original author of it, Hermann, subsequently discovered that this spelling was incorrect, and changed it [in German] to *turjit*; the exact English equivalent of this is *turyite*. Much later Samoilov used for it a Russian word the English transliteration of which is *turite*. Spencer in the paper above cited adopts the last. We prefer to use the *earliest correct spelling*: *turyite*.

E. T. W.

ABSTRACTS—CRYSTALLOGRAPHY

A METHOD OF GROWING LARGE PERFECT CRYSTALS FROM SOLUTION. R. W. MOORE. *J. Am. Chem. Soc.*, 41 (7), 1060-1066, 1919.

The method consists of placing seed crystals in a nearly saturated solution of the salt, cooling the solution until it is very slightly supersaturated, and maintaining a state of slight supersaturation by slowly cooling the solution about 0.1° per day by means of a thermostat, with greater decreases as the crystal grows larger. A clear perfectly developed crystal of Rochelle salt 8 cm long can be produced in a month.

S. G. G.

THE USE OF THE GNOMONIC PROJECTION IN THE CALCULATION OF CRYSTALS. G. F. HERBERT SMITH. *Min. Mag.*, 18 (86), 317-323, 1919.

THE POSSIBLE AXES OF CRYSTAL SYMMETRY. JOHN W. EVANS. *Min. Mag.*, 18 (86), 324-326, 1919.

A simple general proof is given, on the hypothesis that crystals have a homogeneous cellular structure, that the only possible axes of symmetry are those with cyclic numbers 2, 3, 4, or 6.

S. G. G.

COORDINATE TRANSFORMATION IN REGULAR POINT SYSTEMS. A. JOHNSON. *Centr. Min. Geol.*, 1918, 46-49.

A series of mathematical formulas for this purpose.

E. T. W.

THE CRYSTAL STRUCTURE OF TIN. A. J. BIJL and N. H. KOLKMEIJER. *Chem. Weekblad*, **15**, 1077-1078, 1918; ———OF GRAY TIN. SAME AUTHORS and *journal*, **15**, 1264, 1918; INVESTIGATION BY MEANS OF X-RAYS OF THE CRYSTAL STRUCTURES OF WHITE AND GRAY TIN. THE SAME. *Proc. Acad. Sci. Amsterd m*, **21**, 405-408, 1919; thru *Chemical Abstracts*, **12**, 2533, 1918; **13**, 703, 1207, 1919.

The structure of ordinary white tin is found to be prism-face-centered tetragonal, with the horizontal prism edge 5.84×10^{-8} cm. long, and the axis $c = 0.406$ times as long. The usual crystal elements given for tin should accordingly be changed, making 100 = 110 and 111 = 403. The valence of the atoms is 2. Gray tin is cubic, with the diamond lattice, the side of the cube being 6.46×10^{-8} and the nearest atoms 2.80×10^{-8} cm. apart. Here the valence is 4.

E. T. W.

THE GYROHEDRAL CHARACTER OF ROCK SALT. R. GROSZ. *Centr. Min. Geol.*, **1918**, 1-19.

The Bragg structure of NaCl, KCl, etc., is holohedral, and does not exhibit the "usual" valences of the elements concerned. The actual crystals of KCl are gyrohedral [in certain respects. Abstractor], and Grosz infers that NaCl should be similar [inference unjustified. Abstr.] He accordingly suggests a shift of the atoms in the structure as given by the Braggs, which would give the desired symmetry, but could not be detected by X-ray measurements. [The probability of such a shift in the case of KCl was pointed out some years ago by Pope and Barlow. Abstr.] As to valence, Grosz assumes that this is the same in the solid as in the liquid or gaseous states [a quite unreasonable, tho frequently made, assumption. Abstr.] and follows Smits and Scheffer (See abstr. in *Am. Min.* **3**, 144-145, 1918) in regarding the atoms to be united by single valences into groups. The absence of valences between some of the atomic layers he regards as the origin of the cubic cleavage [but does not state why the substance does not fall apart itself if there is nothing to hold it together in these directions. Abstr.].

E. T. W.

THE SYMMETRY OF ICE CRYSTALS. O. MÜGGE. *Centr. Min. Geol.*, **1918**, 137-141.

From all the data available it is concluded that ice is certainly trigonal, and probably hemimorphic, in crystallization.

E. T. W.

THE SYMMETRY OF CUPRITE. ANNI GRÜHN. *Centr. Min. Geol.*, **1918**, 85-97.

The available data indicates the crystal class of this mineral to be cubic tetartohedral, but the results of X-ray studies do not agree with this. The class may be plagihedral, however, altho proof of this would require a method for determining symmetry of individual atoms. [That this mineral is plagihedral in some respects is usually accepted. Abstr.]

E. T. W.

THE CRYSTAL FORM OF BARIUM IODIDE HEXAHYDRATE. O. MÜGGE. *Centr. Min. Geol.*, **1918**, 105-107.

Recrystallization of commercial BaI_2 gives hexagonal prisms with tetartohedral striations. From occasional faces of 2021, $c = 0.538$. The crystals are uniaxial,—, but show no circular polarization. $\text{SrBr}_2 \cdot 5\text{H}_2\text{O}$ is similar, with $c = 0.515$.

E. T. W.

ARTIFICIAL TRANSLATION IN TITANITE. A. JOHNSEN. *Centr. Min. Geol.*, 1918, 152-156.

Gliding planes connected with volume changes produced in titanite by pressure are described. E. T. W.

CALCULATION OF THE LIMITS OF ERROR OF OPTIC AXIAL ANGLES. H. PANEBIANCO. *Riv. min. crist. Ital.*, 49, 46-8 (1917).

Mathematical.

E. T. W.

DETERMINATION OF THE PRINCIPAL INDICES OF REFRACTION OF ANISOTROPIC SUBSTANCES BY OBSERVING THE RETARDATION OF THIN PLATES IN OBLIQUE PARALLEL LIGHT. A. LEDOUX. *Bull. soc. franc. min.*, 40, 119-157, 1917.

A mathematical discussion, with directions for applying the method.

E. T. W.

OPTICAL PHENOMENA IN CRYSTALS. PHOTOTROPIC PROPERTIES OF β -TETRACHLORO- α -KETONAPHTHALENE. FRITZ WEIGERT. *Z. Elektrochem.*, 24, 222-237, 1918. See *Chem. Abstr.*, 13, 1185, 1919.

ABNORMAL BIREFRINGENCE OF TORBERNITE. N. L. BOWEN. *Am. J. Sci.*, [4], 48, (3), 195-198, 1919.

A torbernite examined optically had a mean n of 1.62, and weak positive birefringence, these properties being identified with torbernite which has lost 4 molecules of H_2O ; normal torbernite with $12H_2O$ being optically - with strong birefringence. The interference colors shown were very abnormal; not far from the sensitive tint, tho sometimes showing blue in thin plates or red in thicker plates. The mineral was found to be positive for red, negative for blue and isotropic in the green at about $515 \mu\mu$. These colors combine so as to give the abnormal colors shown. It is therefore a mistake to state that the interference color is always the simple complementary of that for which the mineral is isotropic.

S. G. G.

ABSTRACTS—MINERALOGY

MINERALOGICAL CHARACTERS OF TURITE (= TURGITE) AND SOME IRON-ORES FROM NOVA SCOTIA. L. J. SPENCER. *Min. Mag.*, 18 (86), 339-348, 1919.

See *Am. Min.*, 4, 41, 1919; also under heading "turite," in "New minerals," page 18.

THE HYDRATED FERRIC OXIDES. E. POSNJAK AND H. E. MERWIN. *Am. J. Sci.* [4], 47 (5), 311-348, 1919.

Eighteen analyses of hematite, turgite, goethite, xanthosiderite and limonite are given, with the results of optical, crystallographic and thermal studies. No series of ferric hydrates exists among natural minerals. The only existing ferric hydrate is the ferric oxide monohydrate, occurring in two polymorphic forms: goethite and lepidocrocite, and in an amorphous condition limonite.

Goethite is orthorhombic, $a : b : c = 0.91 : 1 : 0.602$, density 4.28, $\alpha = 2.26$, $\beta = 2.394$, $\gamma = 2.400$; streak dull orange yellow, pleochroism faint.

When crystallized in dense aggregates of thin blades and fibers enclosing much adsorbed and capillary water it has been known as limonite.

Lepidocrocite is orthorhombic, $a : b : c = 0.43 : 1 : 0.64$, density 4.09, $\alpha = 1.94$, $\beta = 2.20$, $\gamma = 2.51$, streak dull orange, pleochroism very strong.

The name limonite is retained for the essentially isotropic ferric monohydrate with adsorbed and capillary water.

The fibrous mineral turgite is variable in composition and considerable evidence is given that it probably represented solid solutions of goethite with hematite with enclosed and adsorbed water.

The genetic conditions of the hydrated ferric oxides and the stability relation of the two monohydrates are unknown. S. G. G.

THE PYRITIFEROUS DEPOSIT AT THE CONTACT OF THE GRANITE AT CHIZEUIL AND ITS METAMORPHIC ROCKS. A. LACROIX. *Bull. soc. franc. min.*, **41**, 14-21, 1918.

This geological article includes descriptions of andalusite, svanbergite, and other minerals. E. T. W.

THE MINERALS OF THE GRITS OF SEGALAS, TUNIS. P. GAUBERT. *Bull. soc. franc. min.*, **41**, 33-38, 1918; abstract reprinted by permission from *Chem. Abstr.*, **13** (9), 947, 1919.

This deposit contains an unusual number of heavy minerals, of which brief descriptions are given. It was found to be an easy matter to distinguish some of them by study under the microscope, after melting in sulfur.

E. T. W.

SOME FASHIONED OBJECTS FROM TIMBUCTU. P. GAUBERT. *Bull. soc. franc. min.*, **41**, 38-40, 1918; abstract reprinted by permission from *Chem. Abstr.*, **13** (9), 947, 1919.

By determinations of density and refractive index and by microchemical tests amazonite and lazulite were recognized. Neither has as yet been found in place in Africa. E. T. W.

NOTES ON JAPANESE MINERALS. VIII and IX. S. ICHIKAWA. *Am. J. Sci.* [4], **48** (2), 124-131, 1919.

Natural etchings of calcite crystals and pits on sphalerite crystals are described. S. G. G.

THE RELATION BETWEEN THE OPTICAL PROPERTIES AND CHEMICAL CONSTITUTION OF THE SCAPOLITES. NILS SUNDIUS. *Bull. Geol. Inst. Univ. Upsala*, **15**, 1-12, 1916.

New analyses of scapolites confirm the views of recent writers, except that the SO_3 is believed to be present as NaHSO_4 instead of Na_2SO_4 and NaHCO_3 instead of Na_2CO_3 . The double refraction and refractive indices if considered together roughly indicate the composition of a given specimen. E. T. W.

DETERMINATION OF THE POWER OF REFRACTION OF A NUMBER OF ALLANITES. N. ZENZÉN. *Bull. Geol. Inst. Univ. Upsala*, **15**, 61-76, 1916.

See article in this number by Thomas L. Watson. (Page 6).

WEATHERING OF ALLANITE. THOMAS L. WATSON. *Bull. Geol. Soc. Am.*, **28**, 463-500, 1917.

An elaborate discussion of the occurrence of allanite, with long lists of its localities in the various states. Optical study of several occurrences (indices determined by E. S. Larsen) showed the existence of at least two minerals (see article in this number, page 6). When found at or near the surface allanite masses are frequently encrusted with a reddish brown alteration product. This has been studied in detail, both microscopically and chemically, and also found to be heterogeneous, altho the bulk of it is isotropic and of variable composition.

E. T. W.

THE CHEMICAL COMPOSITION OF TOURMALINE FROM ÜTO. HJ. SJÖGREN. *Bull. Geol. Inst. Univ. Upsala*, **15**, 317-324, 1916.

Four analyses by N. Sahlbom are given. They support Penfield's formula $H_2B_2Si_4O_{21}$.

E. T. W.

ANALYSES OF SWEDISH GLAUCONITES. NAIMA SAHLBOM. *Bull. Geol. Inst. Univ. Upsala*, **15**, 175-194, 1916.

Two analyses show Al_2O_3 9 to 12 percent., and K_2O 7 to 8 percent.

E. T. W.

STUDIES ON CLAYS. GENERAL INTRODUCTION TO THE CHEMISTRY AND PHYSICAL CHEMISTRY OF CLAYS. SVEN ODÉN. *Bull. Geol. Inst. Univ. Upsala*, **15**, 175-194, 1916.

A good up to date discussion (in German) of the general features of clays, pointing out the importance of colloid chemistry in their interpretation.

E. T. W.

THE OCCURRENCE AND ORIGIN OF THE BARITE ON THE PRESENT OCEAN FLOOR. K. ANDRÉE. *Centr. Min. Geol.*, **1918**, 157-165.

Two occurrences of barite nodules are described. Barium occurs in various oceanic deposits. The concentration may have been either organic or inorganic, the common presence of sulfates and the insolubility of $BaSO_4$ being perhaps favorable to the latter mode of origin.

E. T. W.

ILSEMANNITE. H. F. YANCEY. *Chem. Met. Eng.*, **19**, 186-190, 1918.

Extraction tests of a blue water-soluble molybdenum mineral from Utah are thought to indicate that it is not a sulfate, as suggested by Schaller, but a combination of different oxides of molybdenum. The principal substance present is regarded as $MoO_2 \cdot 4MoO_3 \cdot 6H_2O$ [but in all the discussion by both authors the fact that colloids vary in composition appears to be overlooked. Abstr.].

E. T. W.

GEMS AND PRECIOUS STONES IN 1918. WALDEMAR T. SCHALLER. *Mineral Resources U. S.*, **1918**, II, 7-14, 1919.

A statistical report. An alphabetical list of some industrial uses of precious stones is appended.

S. G. G.